

11 September 1970

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SUPERSEDING

MIL-C-10392B

17 September 1958

## MILITARY SPECIFICATION

## CORD, ELECTRICAL (AUDIO, MINIATURE)

This specification is mandatory for use by all Departments and Agencies of the Department of Defense.

## 1. SCOPE

1.1 This specification covers miniature audio cords with stranded wire conductors for use with microphones, telephones, switchboards, and associated communication equipments. These cords are intended for use at potentials up to 300 volts (rms) at audio frequencies, and at temperatures from -55 to +85 degrees C. (See 3.2 for individual types.)

## 2. APPLICABLE DOCUMENTS

2.1 The following documents of the issue in effect on date of invitation for bids or request for proposal, form a part of the specification to the extent specified herein.

## SPECIFICATIONS

## MILITARY

- |             |  |
|-------------|--|
| MIL-C-572   | - Cords, Yarns and Monofilaments, Organic Synthetic Fiber.                   |
| MIL-I-3930  | - Insulating and Jacketing Compounds, Electrical (for Cable, Cord and Wire). |
| MIL-C-12000 | - Cable, Cord and Wire, Electric, Packaging and Packing For.                 |
| MIL-C-13777 | - Cable, Special Purpose, Electrical.  |
| MIL-C-45662 | - Calibration System Requirements.   |

## STANDARDS

## FEDERAL

- |             |  |
|-------------|--|
| FED-STD-228 | - Cable and Wire, Insulated; Methods of Testing. |
|-------------|--|

## MILITARY

- |             |  |
|-------------|--|
| MIL-STD-105 | - Sampling Procedures and Tables for Inspection by Attributes. |
|-------------|--|

(Copies of specifications, standards, and drawings required by contractors in connection with specific procurement functions should be obtained from the procuring agency or as directed by the contracting officer. Both the title and number or symbol should be stipulated when requesting copies.)

2.2 Other publications. The following documents form a part of this specification to the extent specified herein. Except as otherwise indicated, the issue in effect on date of invitation for bids or request for proposals shall apply.

Rural Electrification Administration (REA) Specifications

PE-210 Crystalline Propylene-Ethylene Copolymer Raw Material.

(Applications for copies should be addressed to the United States Department of Agriculture, Rural Electrification Administration, Washington, D.C. 20250)

American Society of Testing and Materials

B33-63 Standard Specification for Tinned Soft or Annealed Copper Wire for Electrical Purposes.

(Application for copies should be addressed to the American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pennsylvania 19103).

### 3. REQUIREMENTS

3.1 Material. The material used in the cords shall be as hereinafter specified.

3.2 General. The cord types shall be as specified in table I and shall be constructed as follows:

Table I. Cord types and construction.

Cord type designation	Total no. of conductors	Conductor size		Conductor circular mils (nom.)	Cord length of lay (in., max)	Cord diameter (in., nom)
		No. each	AWG			
WD-27A/U	2	2	24	404	1/2	0.146
WT-15A/U	3	3	24	404	1/2	.212
WF-11A/U	4	4	24	404	7/8	.212
WM-59A/U	5	5	24	404	1-1/8	.212
WM-60A/U	6	6	24	404	1-1/4	.252
WM-69B/U	6	{ 2	18	1620	7/8	.262
		{ 4	24	404		
WM-111A/U	7	{ 2	18	1620	7/8	.280
		{ 5	24	404		
WM-61A/U	7	7	24	404	1-1/4	.252
WM-62A/U	8	8	24	404	1-5/8	.262
WM-70B/U	8	{ 2	18	1620	7/8	.285
		{ 6	24	404		
WM-63A/U	9	9	24	404	1-3/4	.280
WM-64A/U	10	10	24	404	2-1/4	.297

3.3 Conductor. The conductor shall be constructed as follows:

3.3.1 Conductor construction, 404 circular mils. Conductors having a nominal cross-sectional area of 404 circular-mils (24 AWG) shall consist of 41 strands, bunch stranded, with a maximum length of lay of 0.6 inch.

3.3.2 Conductor construction, 1620 circular mils. Conductors having a nominal cross-sectional area of 1,620 circular-mils (18 AWG) shall consist of 168 strands, rope lay, consisting of seven bunch-stranded members. Each bunch-stranded member shall contain 24 strands, bunch-stranded, with a maximum length of lay of 0.6 inch. Six of these members shall be twisted concentrically around one member, with a maximum length of lay of 0.8 inch to form the rope-lay conductor.

3.4 Conductor strands. The strands comprising the stranded conductors shall have a cross-sectional area of 9.61 circular-mils (40 AWG). The diameter of the strands shall be 0.0031 inches plus 0.0003 inch, minus 0.0001 inch. Each strand shall be tinned, annealed, cadmium-copper alloy having a 1 percent nominal content of cadmium.

3.4.1 Tin-coating. Each strand shall be coated with commercially pure tin, and shall meet the requirements of ASTM Standard B33-63 for composition, continuity, and adherence. (See 4.5.3.)

3.4.2 Conductor strand tensile strength and elongation. (See 4.5.4.) The tensile strength and elongation of the coated strands, removed from the insulated conductors prior to cabling, shall be as follows:

Tensile strength: 45,000 psi (min.)

Elongation in 10 inches: 13 percent (min.)

3.4.3 Conductor strand resistance. Each conductor strand shall have a dc resistance of 1,310 ohms (max) per 1,000 feet at a temperature at or corrected to 20°C. If the resistance value is lower or equal to that specified, when the measurement is made at a temperature greater than 20°C, no correction factor need be employed. (See 4.5.5.)

3.5 Inner separator. An inner separator shall be applied over each conductor. The separator shall consist of a suitable number of ends of yarn conforming to MIL-C-572, type AR, CTA, or VCR, closely wound to cover the conductor. If however, the insulating compound applied in accordance with 3.6 is free stripping, the separator may be omitted.

3.6 Insulation. A styrene butadiene rubber (SBR) insulating compound conforming to MIL-I-3930, type IS-L, shall be applied over the conductor or inner separator, when present, to a minimum thickness of 0.007 inch. As an alternate insulation, thermoplastic crystalline propylene-ethylene copolymer conforming to PE-210 may be used with a nominal thickness of 0.007 inch, and a 0.005 inch minimum. Insulated conductors having a nominal area of 404 circular-mils (24 AWG) shall have a maximum diameter of 0.059 inch. Insulated conductors having a nominal area of 1,620 circular-mils (18 AWG) shall have a maximum diameter of 0.097 inch.

### 3.7 Color coding.

3.7.1 Cords having all 24 AWG conductors. Cords having all 24 AWG conductors shall use the following colors, in the sequence listed below:

- |            |             |
|------------|-------------|
| 1 - White  | 6 - Blue    |
| 2 - Black  | 7 - Brown   |
| 3 - Red    | 8 - Yellow  |
| 4 - Green  | 9 - Gray    |
| 5 - Orange | 10 - Purple |

3.7.2 Cords WM-69B/U, WM-70B/U, and WM-111A/U. Cords WM-69B/U, WM-70B/U and WM-111A/U shall be color coded as indicated in table II.

Table II. Color code of Cords WM-69B/U, WM-70B/U, and WM-111A/U.

Cord type	Conductor size (AWG)	Color
WM-69B/U	24	White
	24	Red
	24	Green
	24	Blue
	18	Brown
	18	Yellow
WM-70B/U	24	White
	24	Black
	24	Red
	24	Green
	24	Orange
	24	Blue
	18	Brown
	18	Yellow
WM-111A/U	24	White
	24	Black
	24	Red
	24	Green
	24	Blue
	18	Brown
	18	Yellow

3.8 Conductivity of fibers and yarns. The conductivity of the solution prepared from any part of the fibers or yarns used as servings, binders, braid, core, separators, fillers, or staycords, removed from the cord, shall not exceed 50 micro-mhos per centimeter cube, when tested as specified in 4.5.11.

3.9 Fillers. Filler materials shall be a ply yarn of MIL-C-572, type P or CTA; or polyester fiber, polypropylene yarn, or polypropylene filament.

3.10 Staycords. Staycord material shall be in accordance with MIL-C-572, type P or PAA; or polyester fiber, or polypropylene fiber.

3.10.1 Staycord for WD-27A/U. Cord WD-27A/U shall contain one staycord. The staycord shall have a minimum breaking strength of 50 pounds.

3.10.2 Staycord for WM-69B/U. Cord WM-69B/U shall contain two staycords. Each staycord shall have a minimum breaking strength of 25 pounds.

3.10.3 Staycords for WT-15A/U, WF-11A/U, WM-59A/U, WM-60A/U, WM-61A/U, WM-62A/U, WM-63A/U, WM-64A/U, WM-70B/U and WM-111A/U. These cords shall each contain one staycord. The staycord shall have a minimum breaking strength of 60 pounds.

3.11 Cabling. Cabling of the cords shall be as indicated below. The length of lay of the insulated conductors shall be as specified in table I. The staycord or staycords shall be at or near the center of the core, and shall not be twisted together with the insulated conductors. Fillers shall be used in the interstices between the conductors to form an essentially round core prior to jacketing.

3.11.1 Cords WD-27A/U, WT-15A/U, WF-11A/U, WM-59A/U, WM-60A/U, WM-61A/U, WM-62A/U, WM-63A/U, and WM-64A/U. The insulated conductors of these cables shall be concentrically twisted around a central staycord, with the conductors in the same order around the staycord as the color code sequence specified in 3.7.1.

3.11.2 Cord WM-69B/U. The insulated conductors of cord WM-69B/U shall be twisted around two parallel staycords in the configuration indicated in figure 1.

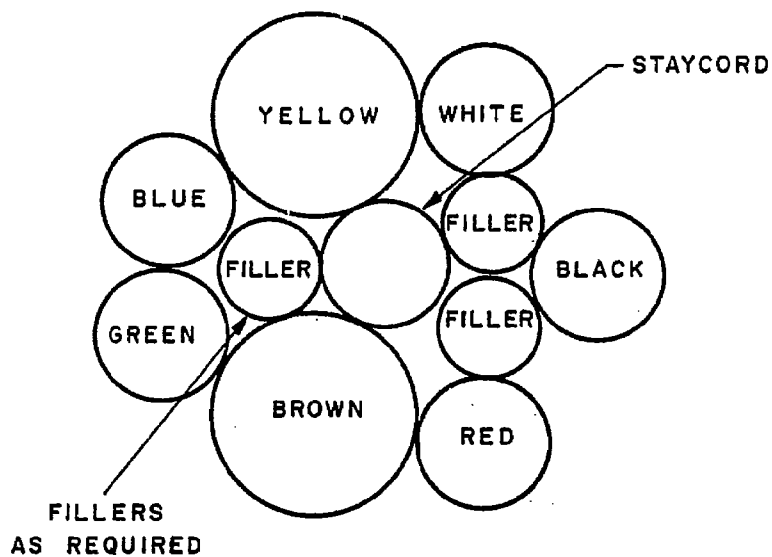
3.11.3 Cord WM-70B/U. The insulated conductors of cord WM-70B/U shall be twisted around a central staycord in the configuration indicated in figure 1.

3.11.4 Cord WM-111A/U. The insulated conductors of cord WM-111A/U shall be twisted with fillers around a central staycord in the configuration indicated in figure 1.

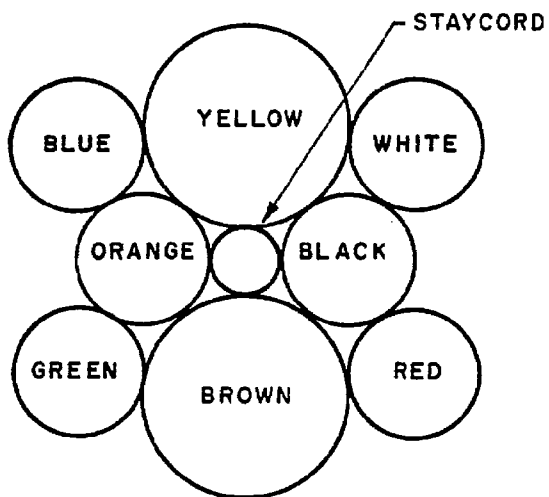
3.12 Outer separator. A separator shall be applied over the cabled conductors. The separator shall consist of a suitable number of ends of yarn or polyester tape closely wound to cover the cabled conductors. The yarn or tape shall be loosely applied over the cabled conductors.

3.13 Jacket. A smooth, dense, SBR jacket, conforming to MIL-I-3930, type JS-L, shall be applied over the outer separator. The minimum jacket thickness shall be 0.015 inch for cord WD-27A/U, and 0.020 inch for the remaining cords. The outside diameters of the cords shall be as specified in table I, with a tolerance of  $\pm 0.010$  inch.

W M-111 A/U



W M-70 B/U



W M-69 B/U

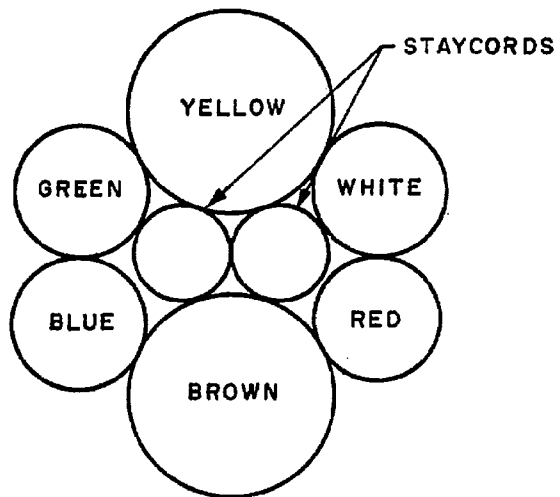


FIGURE 1. CABLING DIAGRAMS

3.14 Cord tensile strength. When tested as specified in 4.5.6, cord WD-27A/U shall have a breaking strength of not less than 50 pounds; the remaining cords shall have a breaking strength of not less than 60 pounds. Continuity of all conductors shall be maintained to at least the minimum breaking strength specified herein.

3.15 Identification marking. Cords shall be identified by inked markings. Inked markings shall be clear and legible, shall be resistant to moisture and oil, and shall not readily abrade when the cord is stepped or tramped upon or dragged on the ground when subjected to the cold bend test. The inked marking shall consist of the type designation followed by the number of this specification and year of manufacture. Digits indicating footage may be used at the option of the manufacturer. The marking shall be repeated along the cord at intervals not more than one foot apart.

### 3.16 Electrical requirements.

3.16.1 Dielectric withstanding voltage. The insulated conductors shall withstand without breakdown an applied voltage of 500 volts (rms) when tested as specified in 4.5.7.

3.16.2 Insulation resistance. Immediately after the insulated conductors have withstood the dielectric withstanding voltage test, the insulation resistance shall be measured as specified in 4.5.8. The insulation resistance of the insulated conductors shall be not less than 600 megohms - 1,000 ft.

3.16.3 Conductor resistance. Each conductor in the finished cord shall be continuous and shall have a direct-current (dc) resistance at or corrected to 20°C, as indicated in table V.

Table V. Conductor resistance.

Conductor size (AWG)	DC resistance (ohms, max./1,000 ft)
24	39.0
18	9.7

If the resistance value is lower or equal to that specified when the measurement is made at a temperature greater than 20°C, no correction factor need be employed. (See 4.5.9.)

3.17 Flexing life requirements. When tested as specified in 4.5.2, the finished cords, except WD-27A/U, shall be capable of being flexed without loss of continuity of any of the conductors for not less than 30,000 cycles. Cord WD-27A/U shall be capable of being flexed without loss of continuity of any of the conductors for not less than 15,000 cycles.

3.18 Operating range. The cords shall be flexible and resilient throughout the temperature range of  $-55^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$ .

3.18.1 Cold bend. Neither the jacket nor the insulation shall show evidence of cracks, flaws, or other damage when tested at  $-55^{\circ}\text{C}$  in accordance with 4.5.10.

3.19 Workmanship. Cords shall be constructed and finished in a thoroughly workmanlike manner in accordance with accepted high grade production techniques. The cords shall be a uniform and consistent product and shall be free from any defects which will adversely affect the serviceability of the product, such as lumps, kinks, splits, abrasions, scrapes, corroded surfaces, skin impurities and faulty extruded surfaces.

#### 4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the supplier is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or order, the supplier may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the government. The government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure that supplies and services conform to prescribed requirements.

4.1.1 Inspection equipment and facilities. Inspection equipment and facilities shall be established and maintained in accordance with MIL-C-45662.

4.2 Classification of inspections. The examinations and tests of cords are classified as follows:

- (a) Materials inspections. (See 4.3.)
- (b) Quality conformance inspection. (See 4.4.)
  - 1. Inspection of product for delivery. (See 4.4.1.)
  - 2. Inspection of preparation for delivery. (See 4.6.)

4.3 Materials inspection. Materials inspection and tests shall consist of certification supported by verifying data that the materials and tests listed in table VI, used in fabricating the designated cord type (see 3.2), are in accordance with the applicable referenced specification or requirements prior to such fabrication.



Table VI. Materials inspection.

Material	Requirement paragraph	Applicable specification
Separators, fillers & staycords	3.5, 3.9, and 3.10	MIL-C-572
Insulation	3.6	MIL-I-3930
Jacket	3.13	MIL-I-3930

#### 4.4 Quality conformance inspection.

4.4.1 Inspection of product for delivery. Inspection of product for delivery shall consist of groups A and B inspection.

4.4.1.1 Inspection lot. An inspection lot shall consist of all cords of the same type (see 3.2) produced under essentially the same conditions and submitted for inspection at the one time.

4.4.1.2 Unit of product. Unless otherwise specified in the contract or order, the unit of product for purposes of sampling shall be each continuous length of finished cord contained on a reel, spool or coil.

4.4.1.3 Sample. The sample shall consist of that number of randomly selected units of product required by the applicable sampling plan for the presented lot.

4.4.1.4 Sample unit. A sample unit is defined as a unit of product selected to be part of a sample.

4.4.1.5 Test specimen. A test specimen may be the entire sample unit (length of finished cord) or any portion of the sample unit which is to be tested.

4.4.2 Group A inspection. Group A inspection shall include the examinations and tests of table VII, sub-groups I and II. Major and minor defects shall be as defined in MIL-STD-105, and as classified below. Any sample unit which has one or more major or minor defects shall be a "defective".

#### Major defects:

- Broken strands in conductor.
- Nicked or torn insulation.
- Occlusions in insulation.
- Inadequate separator coverage.
- Insulation over conductor not centered.
- Conductor coating, insulation thickness, jacket thickness, and diameter of completed cord not in accordance with specification requirements.
- Inadequate shield coverage.

## Minor defects:

Missing strands in conductor.  
 Poor stranding tension.  
 Insulation over conductor not free stripping.  
 Insulated conductors not readily separable.  
 Improper shade of insulation color.  
 Insulation surface not smooth.  
 Length of finished cord not in accordance with delivery instructions.

4.4.2.1 Sub-group I. For sub-group I, the acceptable quality level (AQL) shall be as specified in table VII and the inspection level shall be level II in accordance with MIL-STD-105. Sub-group I tests may be performed in any order.

4.4.2.2 Sub-group II. For sub-group II, the sample shall be 100 percent of the cord in the inspection lot and every length of cord shall be subjected to the tests. Sub-group II tests shall be performed in the order shown in table VII. The entire lot shall be rejected if more than 3 defects per 1000 feet in a lot are found. All electrical defects are considered major.

Table VII. Group A inspection.

Examination or test	Requirement paragraph	Test method paragraph	AQL (percent defective)	
			Major	Minor
<u>Sub-group I</u>				
<u>Visual and mechanical</u>				
Material and construction	3.1 thru	4.5.1	} 1.0% for the sub-group	} 4.0% for the sub-group
Workmanship	3.15 incl 3.19	4.5.1		
<u>Sub-group II</u>				
<u>Electrical</u>				
Dielectric withstanding voltage	3.16.1	4.5.7	}	See 4.4.2.2
Insulation resistance	3.16.2	4.5.8		
Conductor resistance	3.16.3	4.5.9		

4.4.2.3 Rejected lots. If an inspection lot is rejected, the supplier may withdraw the lot from further inspection. The supplier may also rework a rejected lot to correct the defects or screen out the defective units and reinspect the lot using tightened inspection. Rejected lots shall be kept separate from new lots and shall not lose their identity.

4.4.3 Group B inspection. This inspection, including sampling, shall conform to table VIII and to the procedures for small-sample inspection of MIL-STD-105, using special inspection levels. Group B inspection shall be performed on inspection lots that have passed group A inspection and on specimens selected from

units of product that have been subjected to and met the group A inspection. The AQL shall be 6.5 (percent defective), applied individually to each sub-group of group B, and the special inspection level shall be S-2.

4.4.3.1 Order of inspection within Group B. Group B inspection shall be performed in any order which is satisfactory to the government.

4.4.3.2 Disposition of samples. Samples subjected to group B tests shall not be delivered on contract or order.

Table VIII. Group B inspection.

Examination or test	Requirement paragraph	Test method paragraph
<u>Sub-group I</u>		
<u>Conductor strands</u>		
Tin-coating	3.4.1	4.5.3
Tensile strength and elongation	3.4.2	4.5.4
Conductor strand resistance	3.4.3	4.5.5
<u>Sub-group II</u>		
<u>Cord</u>		
Conductivity of fibers and yarns	3.8	4.5.11
Tensile strength	3.14	4.5.6
Flexing life	3.17	4.5.2
<u>Sub-group III</u>		
<u>Insulation and jacket</u>		
Cold bend	3.18.1	4.5.10

#### 4.5 Test methods.

4.5.1 Visual and mechanical inspection. The finished cords shall be given a visual and mechanical inspection for conformance with the requirements of 3.1 to 3.15 inclusive.

4.5.2 Flexing life test. The finished cords shall be tested for compliance with 3.17. The cord flexing machine shall contain a rotating actuating arm whose normal zero position is vertical. The arm shall rotate about a horizontal axis, the outer end traversing a circular arc in a vertical plane. The arm shall rotate 90° from the zero position to a position 90° from the zero position in the opposite direction, and then reverse its direction and rotate back to zero position, thus completing a cycle. The arm shall be rotated at approximately 900 cycles per hour. Two adjustable 1/2 inch diameter mandrels shall be mounted in the machine with their axis perpendicular to the plane of rotation of the actuating arm. The plane through the axis of the two mandrels shall be horizontal and shall pass through the axis of rotation of the actuating arm. The mandrels shall be placed so that

the axis of rotation lies midway between the mandrels. A length of cord shall be inserted between the mandrels which shall be so spaced that there is a slight clearance between the cord and the mandrels. The upper end of the cord shall be attached to the rotating end of the actuating arm. The lower end of the cord shall be attached to a weight: One pound for WD-27A/U, two pounds for WT-15A/U, WF-11A/U, WM-59A/U, and a three pound weight for WM-60A/U, WM-61A/U, WM-62A/U, WM-63A/U, WM-64A/U, WM-69B/U, WM-111A/U, WM-70B/U. There shall be at least five inches of cord from the plane through the axis of the mandrels to the point of attachment on the actuating arm and to the point at which the weight is attached to the cord. The weight shall be lightly snubbed to prevent rotation. The cord shall have all of its conductors connected in series through a relay which will cause the machine to cease operation if any of the conductors momentarily lose continuity. A bending machine such as that described in MIL-C-13777 is a suitable cord flexing machine for use as indicated above. Any other approved machine which will give equivalent mechanical motion to the cord may be used.

4.5.3 Tin-coating. The tin-coating on the conductor strands and the continuity, adherence and finish shall pass the applicable tests specified in ASTM Standard B33-63. (See 3.4.1.)

4.5.4 Conductor strand tensile strength and elongation. This test shall be made in accordance with FED-STD-228, Method 3211. (See 3.4.2.)

4.5.5 Conductor strand resistance. The conductor strand, prior to stranding into a conductor, shall be measured for dc resistance in accordance with FED-STD-228, Method 6021. (See 3.4.3.)

4.5.6 Cord tensile strength. (See 3.14.) The tensile strength shall be made on a tensile testing machine, power driven, and preferably of the pendulum type. The test shall be made at the rate of 12 inches per minute. The conductors of the cord may be connected in series to an indicating or signaling device or automatic stop or both. The arrangement shall be such that an indication will be given when there is a disruption of electrical continuity due to the breaking of the conductors of the cord under tensile test.

4.5.7 Dielectric withstanding voltage. (See 3.16.1.) Cords shall be tested in accordance with FED-STD-228, Method 6111 except that:

- (a) The test shall be performed on sample units of finished cords only.
- (b) The immersion period shall be not less than 6 hours.
- (c) An alternating potential, as specified in 3.16.1, shall be applied between two terminals, one being each conductor in turn, and the other being all the remaining conductors tied together in electrical contact with the water.

4.5.7.1 Alternate test procedure. The following alternate test procedure may be used in place of the test procedure specified above.

- (a) Arrange the conductors in a rectangle containing rows and columns as specified below. The last column will contain unused spaces as specified below.

<u>No. of conductors</u>	<u>No. rows</u>	<u>No. columns</u>	<u>No. unused spaces</u>
3	2	2	1
4	2	2	0
5	2	3	1
6	2	3	0
7	3	3	2
8	3	3	1
9	3	3	0
10	3	4	2

- (b) Connect all the conductors in a column together. Do this for each column.
- (c) Apply the specified test voltage, for the specified time, between each column of the rectangle in turn, and the remaining columns connected together and also tied together in electrical contact with the water.
- (d) Connect all the conductors in a row together. Do this for each row.
- (e) Apply the specified test voltage, for the specified time, between each row of the rectangle in turn and the remaining rows connected together and also tied together in electrical contact with the water.

4.5.8 Insulation resistance test. This test shall be performed on sample units of the finished cords in accordance with FED-STD-228, Method 6031, except that the immersion period shall be not less than 6 hours. (See 3.16.2.)

4.5.9 Conductor resistance. The direct-current resistance of each conductor shall be measured on the sample units of finished cords in accordance with FED-STD-228, Method 6021, except that the immersion period shall be not less than 6 hours. (See 3.16.3.) To ascertain added length of conductor due to pairing and cabling, the measured length of the cords shall be corrected for length of lay by the appropriate pairing and cabling factor computation.

4.5.10 Cold bend.

4.5.10.1 Specimens. One specimen from each sample unit shall be prepared for test. Each specimen shall be divided into two parts, one for checking the cord as a whole and the other for checking the insulation apart from the cord.

4.5.10.2 Procedure. The specimens selected for checking the cord as a whole shall be attached to the proper size mandrel as specified in 4.5.10.2.1. The specimens shall be suspended vertically with lower ends weighted sufficiently to keep specimens taut and to permit bending them without handling. The mandrel and specimens shall be placed for at least 20 hours in the cold chamber at the specified temperature (see 3.18.1). While at this temperature, the specimens shall be bent for seven close turns around the mandrel at the rate of approximately fifteen turns per minute. After the test has been completed, the jacket on the specimen of cord shall be examined for damage through a magnifying glass of at least three diameter's magnification. The jacket shall be carefully removed and the individual conductor insulation of all specimens shall be examined for damage with the magnifying glass. Only the five inside turns shall be considered for evidence of damage.

4.5.10.2.1 Mandrels for cords. The mandrel for testing the cord shall be selected from the following standard size mandrel diameters.

<u>Mandrel diameters (inches)</u>
0.500
0.680
0.840
1.050

The size selected shall be the largest size which does not exceed three times the specified nominal diameter of the cord.

4.5.10.2.2 Mandrels for insulation. The mandrel for testing the insulation apart from the cord shall be selected according to the size of the conductor as follows:

<u>Conductor size (AWG)</u>	<u>Mandrel diameter (inches)</u>
24	0.062
18	0.094

4.5.11 Conductivity of fibers and yarns. The fibers and yarns shall be subjected to the following test: One-half gram of material removed from the finished cord shall be boiled for 10 minutes in 60 to 70 cubic centimeters of distilled water which has a conductivity of not more than 5 micromhos per centimeter cube at 20°C. Enough distilled water shall then be added to make a volume of 100 cubic centimeters. The conductivity of this solution shall be measured with alternating current, and shall be determined as the average of two specimens removed from each sample unit. If the average thus determined exceeds the requirement specified in 3.8, the sample unit shall be considered defective. A conductivity cell may be used for this test.

4.6 Inspection of preparation for delivery. Sample packages or packs and the inspection of the preservation, packaging, packing and marking for shipment and storage shall be in accordance with the requirements of Section 5.

## 5. PREPARATION FOR DELIVERY

5.1 Preservation, packaging, packing, and marking shall be in accordance with MIL-C-12000. (See 6.2.)

## 6. NOTES

6.1 Intended use. The cords covered by this specification are intended for use with microphones, receivers, headsets, handsets, etc., where small diameter and flexibility are advantageous.

6.2 Ordering data. Procurement documents should specify the following:

- (a) Title, number and date of this specification.
- (b) Type required. (See 3.2.)
- (c) Length of finished cords to be delivered.
- (d) Level of packaging and level of packing required. (See 5.1.)

6.2.1 Indirect shipments. The preservation, packaging, packing and marking specified in Section 5 apply only to direct purchases by or direct shipments to the government, and are not intended to apply to contracts or orders between the supplier and prime contractor.

### Custodians:

Army - EL  
Navy - AS  
Air Force - 17

### Preparing Activity:

Army - EL

Project Nr. 6145-0544

### Review:

Army - AT, MI  
Navy - AS  
Air Force - 17, 80, 85  
NSA  
IS

### Users:

Army - AT, AV, ME, MU  
Navy - EC, MC, OS